<u>REMARKS/ARGUMENTS</u>

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 24 and 27-46 are pending in the present application, Claims 24 and 27-47 having been amended and Claim 47 having been cancelled by way of the present amendment. Support for amendments to the claims can be found in the disclosure as originally filed, at least on page 9, page 14, line 35 to page 15 line 4 and page 21, line 31 to page 24, line 9. Thus, no new matter is added.

In the outstanding Office Action, Claims 24 and 27-47 were rejected under 35 U.S.C. §103(a) as unpatentable over <u>Zinky et al.</u> (U.S. Patent No. 6,480,879, hereinafter <u>Zinky</u>) in view of <u>Neureiter et al.</u> ("The BRAIN Quality of Service Architecture for Adaptable Services with Mobility Support", herein <u>Neureiter</u>) and <u>Baugher</u> (U.S. Pat. No. 5,644,715) and in further view of <u>Jørgensen et al.</u> ("Customization of Object Request Brokers by Application Specific Policies," herein "<u>Jørgensen</u>").

Addressing now the rejection of Claim 24-47 under 35 U.S.C. §103(a) as unpatentable over <u>Zinky</u>, <u>Neureiter</u>, <u>Baugher</u> and <u>Jørgensen</u> this rejection is respectfully traversed.

Amended Claim 24 recites, in part,

> configure an application programming interface as a data model describing quality-of-service adaptation paths as specified by quality-of-service aware mobile multimedia applications using said application programming interface, in order to manage quality-of-service and mobility-aware network connections with other applications, a quality-of-service adaptation path defining an adaptation policy <u>in terms of</u> <u>alternative quality-of-service contracts</u> identifying <u>alternative</u> quality-of-service specifications <u>and rules for switching</u> <u>between the alternative quality-of-service contracts based on a</u> <u>comparison of the contracted QoS specification with the actual</u> <u>quality-of-service</u>, and
> wherein said middleware is adapted to <u>repeatedly</u> <u>measure the actual quality-of service and to repeatedly select</u>

one of the alternative quality-of-service contracts according to the rules for switching between the alternative quality-of-service contracts based on a comparison of the contracted quality-of-service specifications with the actual quality-of-service, the quality-of-service specifications of the selected quality-of-service contract describing a currently to be achieved quality-of-service for one or more network connections, and

wherein the adaptation paths are modeled as hierarchical finite state machines, each quality-of-service contract of an adaptation path corresponding to a different state of a hierarchical finite state machine, said rules for switching between the alternative quality-of-service contracts corresponding to transitions between the states of a hierarchical finite state machine and each hierarchical finite state machine comprising:

a finite state machine associated with a User Context, a finite state machine associated with an Application Context nested in said finite state machine associated with said User Context and a finite state machine associated with a Session Context nested in said finite state machine associated with said Application Context,

wherein said User Context, said Application Context and said Session Context each identify an arrangement of quality-of-service specifications enforceable through a set of streams belonging to a given user, multimedia application and telecommunication session, respectively, the given user partaking in the given telecommunication session by means of executing the given multimedia application, and

wherein said arrangements of quality-of-service specifications identified in said User Context, said Application Context and said Session Context are specified by said multimedia applications using said application.

Zinky describes a system that determines a quality of service and regulates activity in a distributed system based on the determined quality of service. Further, Zinky discloses a measurement of actual QoS.[1] However, Zinky does not describe or suggest rules for switching between alternative QoS contracts, as is recited in Claim 24.

For instance, Zinky describes switching between negotiated regions (see e.g. the transitions, between the negotiated region "Low-Cost" and the negotiated region "Available" in Fig, 6). However, Zinky does not disclose rules for switching between these negotiated

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[1] See Zinky, c. 6, l. 18-21 or the "provided replicas system condition" described in c.6, 1.62 to c.7, 1.57.

regions. Specifically, Zinky does not disclose rules for switching between the negotiated

regions based on a comparison of the contracted QoS specifications with the actual QoS. As

can be seen from column 6, line 62 to column 8, line 45 of Zinky, a "client expected replicas

system condition" is compared to the negotiated regions in order to select the active

negotiated region, whereby the client expected system condition value is a value set by a

client object (i.e. multimedia application). When the QoS (i.e. at least two replicas) as

specified in the negotiated region "Normal" is not achieved, the reality region in the

negotiated region is switched, the negotiated region, however, is not switched (the system

transitions from the region Normal.Normal to the region Normal.Too-Low). Thus, Zinky

clearly describes that the active negotiated region is determined by comparing the negotiated

regions (QoS specifications) with the QoS requested by the application. The active negotiated

region is therefore, in essence, selected by only the multimedia application. This is a

fundamental difference from the claim invention, in which the selection of the QoS contract

is based on the comparison of the contracted QoS specifications with the actual quality of

service and the selection is performed by the middleware for the multimedia applications. In

the claimed invention, the burden to decide on a new QoS Contract, in the event that the QoS

according to the current QoS contact is not accepted, is placed on the multimedia

applications, ensuring a more accurate determination.

In addition, according to the claimed invention, adaptation paths are modeled as

hierarchical finite state machines (HFSMs). Zinky discloses an object called "QoO contract"

(also referred to as "contract" by Zinky) which is a WSM. However, it is clear that the

specific structure and use of HFSMs in the claimed invention is different from that disclosed

in Zinky. For instance, as is acknowledged in section 8 of the Office Action dated

02/06/2008, Zinky does not teach the use of User, Application and Session Contexts. The

structure and use of the HFSM/adaptation path in the claimed invention is based on these

User, Application and Session Contexts. Thus, at least for this reason, the specific structure

and use of HFSMs in the claimed invention differs from the description of Zinky.

Neureiter describes a general architecture of a system enabling applications to specify

QoS and adaptations for QoS violations. Further, Neureiter mentions the general need for

QoS adaptation. However, Neuteiter is silent on the specific properties of the QoS adaptation

path as is recited in the claimed invention. For instance, Neureiter does not teach rules for

switching between the alternative quality-of-service contracts based on a comparison of the

contracted QoS specification with the actual QoS and does not teach User, Application and

Session contexts. Baugher describes a system for coordinating distributed multimedia

resources.

However, neither Neureiter nor Baugher cures the deficiencies of Zinky with regard

to the claimed invention.

Nevertheless, the outstanding Action relies on the newly cited Jørgensen as curing the

deficiencies of Zinky, Neureiter and Baugher with regard to the claimed invention.

Jørgensen describes an architectural framework for customizing Object Request

Broker (ORB) implementations to application-specific preferences (i,e, QoS expectations)

called "policies". The application specific QoS expectations are defined by the programmer

of an application using the framework. Specific instances of an ORB component guarantee to

deliver a service at a specific QoS. The guaranteed QoS is specified by the

programmer/developer of an ORB component instance in a so called "component descriptor."

At runtime, a specific instance of an ORB component is selected by comparing the

application specific policies with the component descriptors.[2] As the policies describe the

QoS to be achieved, the policies cannot be asserted as corresponding to anything other than

the QoS contracts of the claimed invention and the negotiated region of Zinky.

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[2] Jørgensen, section 2.

However, Jørgensen cannot be asserted as being equivalent to the claimed invention as the ORB component instances of Jørgensen guarantee specific levels of QoS so that no measurement of the actual QoS provided is necessary and, as a result, no such measurement is carried out. In other words, Jørgensen and the claimed invention operate in completely different ways. For instance, in the claimed invention, the expected QoS is adapted to the QoS that is actually achieved while in Jørgensen, the QoS that is achieved is adapted to an expected QoS. Clearly, Jørgensen does not teach rules for switching between the alternative QoS contracts based on a comparison of the contracted QoS specifications with the actual QoS. The service level guarantees of Jørgensen which are defined in the component descriptors tend to teach away from the claimed invention.

Further, Jørgensen does not describe or suggest user specific QoS specifications or session specific QoS specifications as are identified in the User Context and the Session Context of the claimed invention. Applicants note that the user, application and session specific QoS specifications of the claimed invention are recited as being specified by the (multimedia) applications. In contrast, the service level guarantees defined in the component descriptors of Jørgensen are not specified by the application using the ORB component (the service level guarantees are specified by programmer of the ORB component instance). The service level guarantees defined in the component descriptors of Jørgensen therefore *cannot be asserted as being equivalent to the arrangements of QoS specifications of the User, Application and Session Contexts*.

In the Advisory Action mailed July 8, 2008, the descriptions of the RoutingBean and the ReliabilityBean of Jørgensen are interpreted as being states of a finite state machine (FSM). As can be seen from the definition provided in the Advisory Action, a FSM, in addition to states, requires *transitions between the states*. However, no such transitions are disclosed by the Jørgensen reference. Specifically, Jørgensen describes that at the so called

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"variation point" (which is reached only once, particularly at the method invocation[3]) one of

the component instances of a component is selected. After the variation point is passed, the

system is in one of the supposed "states." However, because the system is not in any one of

the supposed "states" before this variation point is reached, no transition between the states is

specified and no transition between the "states" occurs. Applicants note that the occurrences

of the ORB components (like, for example, the RoutingBean or the ReliabilityBean) are not

states of a FSM. It is further noted that, even when starting from description in Zinky,

Jørgensen does not teach rules for switching between alternative QoS contracts, the rules

corresponding to transitions between states of a FSM.

Moreover, Jørgensen does not describe or suggest QoS specifications specific to a

user of one of the multimedia applications. In the Advisory Action mailed July 8, 2008, the

TransportBean or the designers of the TransportBean are cited as teaching a user specific

component. However, the designers of the TransportBean cannot be asserted as describing

this feature as the designers are not users of the multimedia applications. Further, the user

specific QoS specifications recited in the claimed invention are specifications which are

specified by the multimedia applications. Therefore, the service level guarantees defined by

the designers of the TransportBean in the component descriptor can not be asserted as being

equivalent to the user specific QoS specifications recited in the claimed invention.

In addition, Jørgensen does not disclose QoS specifications specific to a

telecommunication session. In the Advisory Action mailed July 8, 2008, the ChannelBean

was cited as teaching a session specific component. The sole information on the ChannelBean

given by Jørgensen is that the "ChannelBean is responsible for session management between

address spaces." It is not possible to assert that QoS specifications specific to a

telecommunication session are described by this description. In addition, the ChannelBean of

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[3] See e.g. section 2.3 of Jørgensen

Jørgensen does not describe or suggest QoS guarantees that are specified by the multimedia applications and, therefore, this element cannot be asserted as corresponding to the session specific QoS specifications of the claimed invention.

Therefore, Jørgensen does not cure the deficiencies of Zinky with regard to the claimed invention. Further, these two references in combination neither describe nor render obvious an arrangement of QoS specifications enforceable through a set of streams belonging to a given user, wherein the arrangement of QoS specifications is specified by the multimedia applications using the application programming interface and the given user is a user of a given one of the multimedia applications. Further, this combination does not describe or render obvious an arrangement of QoS specifications enforceable through a set of streams belonging to given a telecommunication session, wherein the arrangement of QoS specifications is specified by the multimedia applications using the application programming interface.

Thus, neither Jørgensen nor Zinky differentiates between the streams of a given multimedia application (and QoS specifications for these streams), the streams of a given user (and QoS specifications for these streams) and the streams of a given telecommunication session (and QoS specifications for these streams), whereby the given user is partaking in the given multimedia session by means of executing the given multimedia application. As a result of this differentiation, the QoS specifications of the claimed invention are able to be faster and more flexible than prior systems.

Further, in the Advisory Action mailed July 8, 2008, it is asserted that there is a "hierarchy with the TransportBean at the top and the RoutingBean and ReliabilityBean...below it." However, Applicants respectfully submit that such a configuration amounts to a two stage hierarchy, whereas the claimed invention clearly recites

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a three stage hierarchy. Therefore, this feature of the claimed invention is clearly not rendered obvious by the description of Jørgensen.

Further, according to the claimed invention, there is a specific hierarchy of a FSM associated with an *Application Context* identifying an arrangement of multimedia application specific QoS specifications nested in a FSM associated with a User Context identifying an arrangement of user specific QoS specifications. No such hierarchy with a "user related" FSM on top and an "application related" FSM below it (in the middle) is described or suggested by Jørgensen or Zinky alone or in combination.

In addition, in the claimed invention, there is also a specific hierarchy of a FSM associated with a *Session Context* identifying an arrangement of telecommunication session specific QoS specifications nested in the FSM associated with the Application Context identifying the arrangement of the application specific QoS specifications. No such hierarchy with a "session related" FSM at the bottom and an "application related" FSM above it (in the middle) is described or suggested by Jørgensen or Zinky alone or in combination.

Accordingly, Jørgensen does not describe or suggest the features of the claimed invention recited in Claim 24. Thus, Jørgensen cannot be cited as curing the above noted deficiencies of Zinky, Neureiter and Baugher with regard to the claimed invention.

Accordingly, Applicants respectfully submit that Claim 24 and claims depending therefrom, patentably distinguish over Zinky, Neureiter, Baugher and Jørgensen considered individually or in combination.

Consequently, in view of the present amendment and in light of the foregoing

comments, it is respectfully submitted that the invention defined by Claims 24 and 27-46, as

amended, is patentably distinguishing over the cited art. The present application is therefore

believed to be in condition for formal allowance and an early and favorable reconsideration
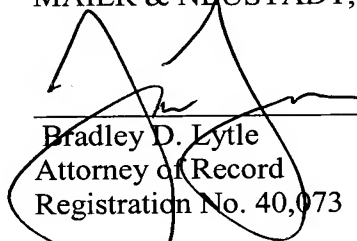
of this application is therefore requested.

Respectfully submitted,

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